

# Heart Health – Through Diet

by David Musgrave MAgSci, DipHortSci

The dietary advice frequently given to patients at risk of a heart attack has now been shown to potentially increase the risk of a fatal heart attack.

## The Lyon Diet Heart Study

Have you ever heard of perhaps one of the most important heart studies ever done? Despite the results being published in The Lancet (1994), The American Journal of Clinical Nutrition (1995) and the Journal of the American College of Cardiology (1996), it seems that many health professionals are not aware of the implications of this study for their treatment of heart disease.

The Lyon Diet Heart Study was a very carefully designed prospective, randomised, single-blinded, clinical trial involving over 600 patients who had been hospitalised with heart attacks. Half were left on the “prudent” American Heart Association style diet, with low fat, high polyunsaturated oil intake (Omega-6 oils like sunflower, cotton seed or soybean). The other half were changed to a Mediterranean style diet, with moderate quantities of oils rich in Omega-3 Essential Fatty Acids (EFAs) - (flax or canola), moderate quantities of Omega-9 oils (olive or canola) and increased fruit and vegetable intake to give increased fibre and antioxidant vitamins.

After just four months the difference in death rate was already statistically significant. After two years the patients on the Mediterranean style diet had a substantially lower (76%) risk of dying from cardiovascular disease or suffering heart failure, heart attack or stroke. The trial was stopped at this point because the Mediterranean style diet was proving so superior that it would have been unethical to continue the research. The Mediterranean style diet had proven **more effective at saving lives than any other heart diet, drug, lifestyle programme or any combination of these elements.**

## More Evidence

It is well known that heart disease is rare in the Greenland Inuit on their traditional diet and this has been attributed to their high intake of Omega-3 from consumption of marine animals and fish.

The Mediterranean style diet first came to the attention of the medical community in the 1960s when the results of a 15 year study, involving 14,000 men from seven widely different countries, showed that the men from Crete were substantially healthier than the others. Compared to Americans for example, they had half the cancer death rate and an astonishing one-twentieth the death rate from coronary heart disease.

One of the puzzles from this study was that the men from Crete also had half the overall death rate of the Italians, who were eating a similar Mediterranean style diet rich in olive oil, legumes, fruits and vegetables. It wasn't until nearly 20 years later that the likely explanation was discovered - that the Cretan diet specifically included higher levels of Omega-3 from greens and herbs like purslane.

More evidence came from another large scale English study in 1989 where 2033 men who were recovering from heart attacks were assigned to one of three diets. They were given either a high fibre diet, a low saturated fat and relatively high Omega-6 EFA oil diet (the “Prudent Heart Diet”) or thirdly Omega-3 supplements or fatty fish. After two years, relative to the other two groups the patients who had enriched their diets with Omega-3 fatty acids had a 29% lower death rate.

## How does your choice of fats affect the risk of heart disease?

### Blood Pressure

The first step in the formation of plaque in the arteries is damage to the artery wall lining. Some damage from wear and tear is unavoidable, but the risk of damage is greatly increased by high blood pressure.

- Omega-3 oils - consistently lower blood pressure.
- Omega-6 oils - can increase your blood pressure.
- Omega-9 oils - can reduce elevated blood pressure.
- Saturated fats - can increase your blood pressure.
- Trans fats - effect unknown.

### Arterial Inflammation

Once an artery becomes damaged, the body's natural repair processes kick in. This process promotes healing, but can also promote clotting and inflammation. A recent study linked arterial inflammation with greatly increased risk of a heart attack suggesting that preventing chronic arterial inflammation is just as effective at lowering your risk of heart attack as reducing your LDL (bad) cholesterol. The fact that aspirin helps reduce inflammation may be one of the reasons it helps protect against heart attacks.

- Omega-3 oils - are the precursors for the prostaglandins that dampen down the inflammatory response, so are powerfully anti-inflammatory.
- Omega-6 oils - are the precursors for the prostaglandins that maintain the inflammatory response.
- Omega-9 oils - effect unknown.
- Saturated fats - effect unknown.
- Trans fats - effect unknown.

### Development of Atherosclerosis

Reducing the accumulation of plaque which progressively blocks damaged arteries used to be focussed on lowering blood levels of LDL (bad) cholesterol. More recent insights into the mechanisms involved allow a much more sophisticated approach.

Before the LDL cholesterol can be carried into the artery wall to form part of the plaque, it must be engulfed by a macrophage. This only happens when the cholesterol has been damaged by oxidation. This is where the fruit and vegetables of the Mediterranean style diet come in. They are very rich in natural antioxidant vitamins and phytochemicals, which protect the cholesterol from oxidation.

The Mediterranean style diet also protects the body against cholesterol oxidation by replacing Omega-6 oils with Omega-9 oils, like olive oil, which make a form of LDL cholesterol which is inherently more resistant to oxidation.

### Control of Cholesterol and Triglycerides

Reducing the body loading of triglycerides and LDL (bad) cholesterol is still a part of reducing the risk of heart disease. However this goal is far less important than is still commonly perceived. There are many studies showing that there is little or no connection between lowering blood cholesterol levels and lowered risk of heart disease and one that suggests that, after the age of 70, the higher your cholesterol level the longer you live.

- Omega-3 oils - can substantially reduce triglycerides, lower LDL (bad) cholesterol and can increase the amount of HDL (good) cholesterol.
- Omega-6 oils - can reduce both total and LDL (bad) cholesterol, but if they are taken at levels supplying more than 12% of energy (not difficult to do on a typical Western diet) they can also lower the levels of HDL (good) cholesterol.
- Omega-9 oils - can reduce both total and LDL (bad) cholesterol while maintaining or even increasing HDL (good) cholesterol.
- Saturated fats - usually raise LDL (bad) cholesterol while maintaining or even increasing HDL (good) cholesterol.
- Trans fats - usually raise LDL (bad) cholesterol while lowering HDL (good) cholesterol.

Again, the high fruit and vegetable intake of the Mediterranean style diet provides the soluble fibre necessary to bind to the cholesterol excreted by the liver and carry it into the colon. Such food also provides the insoluble fibre necessary to carry it safely out of the body (see the article "Dietary Fibre for Health").

### Blood Clots

Typically an artery becomes blocked when a large area of plaque ruptures and triggers a clot, which can then block a coronary artery causing a potentially lethal heart attack.

- Omega-3 oils - consistently lowers the risk of clotting by both making the platelets less "sticky" and by reducing the production of fibrinogen – the key protein involved in the formation of a clot.
- Omega-6 oils - can increase the risk of clots forming.
- Omega-9 oils - do not affect the risk of clotting, but the squalene in Olive oil does have anti-clotting properties.
- Saturated fats - can increase the risk of clots forming.
- Trans fats - does not change the risk.

### Arrhythmia

If your heart responds to the arterial blockage during a heart attack by beating erratically, it no longer functions as an efficient pump and the blood flow to the brain may be so reduced that death follows shortly after. Non-fatal arrhythmias can also occur separately from a heart attack event and these are also affected by EFA nutrition.

- Omega-3 oils - consistently reduce the risk of heart arrhythmia.
- Omega-6 oils - the prostaglandins and leukotrienes produced from these promote arrhythmia.
- Omega-9 oils - no known effect on arrhythmia.
- Saturated fats - can increase the risk of heart arrhythmia.
- Trans fats - effect unknown.

### Conclusion

Omega-3 EFA oils have the potential to reduce all of the six recognised physical changes leading to a heart attack, which means they can even save the lives of people with advanced coronary disease. A study done with monkeys on a diet similar to the Mediterranean style diet, suggests that the progression towards a heart attack can even be reversed. Atherosclerosis was reduced from 90%-occluded arteries to 60%-occluded over four years. This evidence is a very strong case for the regular use of a high quality source of Omega-3 in the diet, such as *waihi bush organic farm* flax seed oil blends.

Omega-6 EFA oils are beneficial in moderate amounts, but the excessive levels found in most modern diets - including the "Prudent Heart Diet"; probably lead to an overall increase in the risk of a heart attack (they also increase the risk of

cancer). There is strong evidence that the human body evolved on a dietary intake of Omega-6:Omega-3 ratio of about 1:1 and this is the ratio found in a healthy brain. The average dietary intake in NZ is likely to be around 15 - 20:1.

Omega-9 oils can reduce the risk of a heart attack by a number of pathways and Olive oil also contains squalene, which can reduce clotting and lower cholesterol, so Olive oil is the preferred choice of Omega-9 (not olive oil margarines).

Saturated fats do increase the risk of heart disease, but they have always been a part of our diet because our body and brain need fat - which is why when you go on a low fat diet you tend to crave rich fatty foods. Most people do have too much saturated fat in their diet, but if enough good fats are eaten then total fat intake can safely be kept to around 30-35% of calorie intake.

Trans fats are found in refined oils and margarines. Margarine is a partially hydrogenated vegetable oil, which contains both trans fats and reduced amounts of EFAs compared to the parent oil. A Boston study found that people with the highest intake of trans fats in their diet had two and a half times the risk of a heart attack as those who eat the least amount - a little butter is better for both spreading and cooking.

The high fruit and vegetable intake of the Mediterranean style diet reduces the risk of a heart attack and many other conditions by its content of antioxidant phytochemicals and fibre. The physiological mechanisms by which the Mediterranean style diet reduces the risk of a heart attack are well understood and have been demonstrated to work both in well designed clinical studies and in population studies.

A major focus of the Heart Foundation dietary recommendations is to reduce total fat intake - particularly saturated fat. A secondary focus is to switch to the use of polyunsaturated (Omega-6) oils and margarine instead of butter and to increase the intake of fruit and vegetables.

The Lyon study and other results quoted here show that such dietary advice needs a change of emphasis, to substantially reduce the risk of heart disease.

**The American Heart Association (AHA) has recently recognised this in a newly released (Nov 2002) scientific statement, and dietary guidelines for Health Care professionals, in which it notes the beneficial effects of adding flax seed and flax seed oil to an individual's diet (see web page: <http://www.circ.ahajournals.org/>).**

The value of a Mediterranean style diet is that by replacing the bad fats (like saturated animal fat, polyunsaturated oils and margarine) with good fats (like Flax Seed and Olive oils) it is easy to achieve good health without having to drastically reduce fat intake. Thus with its emphasis on eating fresh, succulent and tasty food, a Mediterranean style diet is much easier to stick to than the succession of watery salad dressings, fat free cheese, steamed vegetables and skinless chicken breasts which seem to go hand in hand with the Heart Foundation dietary recommendations!

Note: this article was prepared by David Musgrave and is based on published scientific and medical literature.

#### References

- Simopoulos, A.P., Robinson, J 1998: The Omega Plan. Hodder & Stoughton, Rydalmere,  
DeLorgeril, M., Mamelle, N., Martin, J.L., Monjaud, I., Guidollet, J., Touboul, P., Delaye, J., 1994: Mediterranean alpha-linolenic acid-rich diet in secondary prevention of coronary heart disease. *Lancet*. **343**: 1454-59.  
Schmidt M. A. 1997: Smart Fats: How dietary Fats & Oils Affect Mental, Physical & Emotional Intelligence. Frog Ltd. Berkeley.  
Erasmus U. 1993: Fats that Heal Fats that Kill. Alive Books, Burnaby  
Simopoulos, A.P. 1991: American Journal of Clinical Nutrition. **54**:438-63.  
British Nutrition Foundation 1992. Unsaturated fatty acids: nutritional and physiological significance. Chapman & Hall, London.  
J A Monro 1989: Dietary Fibre in Human Nutrition. Proc. '89 Cereal Science Conference: 76 - 79  
Ascherio, A., Hennekens, C.H., Willett, W.C. 1994: Trans-fatty acid intake and the risk of myocardial infarction. *Circulation*. **89**: 94-101.  
Burr, M.L., Gilbert, J.F., Deadman, N.M. 1989: Effects of changes in fat, fish and fibre intakes on death and myocardial reinfarction. *The Lancet*. : 757-761.  
Renaud, S., Paul, T., 1995: Cretan Mediterranean diet for prevention of coronary heart disease. *Am J Clin Nutr* **61**:1360-7S.  
DeLorgeril, M., Salen, P., Delaye, J. 1996: Effects of a Mediterranean type of diet on the rate of cardiovascular complications in patients with coronary artery disease. *J Amer Coll Cardiology*. **28**: 1103-8.

**Functional Whole Foods New Zealand Limited**  
P O Box 49 - 31 Kennedy Street - Geraldine 7956 - NEW ZEALAND  
Ph: +64 (0) 3 693 0034 - Fax: +64 (0) 3 693 0035  
[www.fwf.co.nz](http://www.fwf.co.nz)